



4th ISMI
Symposium on
Manufacturing
Effectiveness

Call to Action on the Next Generation Factory

4th ISMI Symposium on Manufacturing Effectiveness
Doug Grose
AMD

Today's Business Environment

A New Strategy: Manufacturing SMART

Collaborating for Efficiency

Building the Next Generation Factory – A Lean Framework

Summary

Today's Business Environment



Complex global networks of internal and external operations

- Back-end operations as important as fabrication
- Supply chain management more complicated
- Alignment of resources critical
- Information sharing



Diverse product sets

- High volume and low volume parts
- Varying lifecycles and demand cycles



Escalating fixed costs for fabrication

- 300mm fabrication facilities
- Fundamental research and technology development

Collaborating to achieve
maximum return on current investments
while laying a foundation for the future.

Agenda

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Supply Chain Transformation

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“Don’t Rock the Boat” Arguments

Complex processes can’t be streamlined

Expensive products leave no room for trial and error

Why crawl forward with incremental improvements when we leap forward with an established cadence of wafer and node scaling?

**Ignores the law of inertia –
an industry at rest, stays at rest**

Blind Focus on Raw Capacity

Doesn't consider customer demand

Charges customers an "inefficiency tax"

- Excess inventory
- Unnecessary capital expenditures

SMART: The Next Generation Factory

SMART

Honing every aspect of AMD operations to increase customer value,
by maximizing ...

*Return on
Investment*

*Factory speed
and flexibility*

*Customer
Responsiveness*

Collaboration

**Lean
Manufacturing**

**Supply Chain
Transformation**

Agenda

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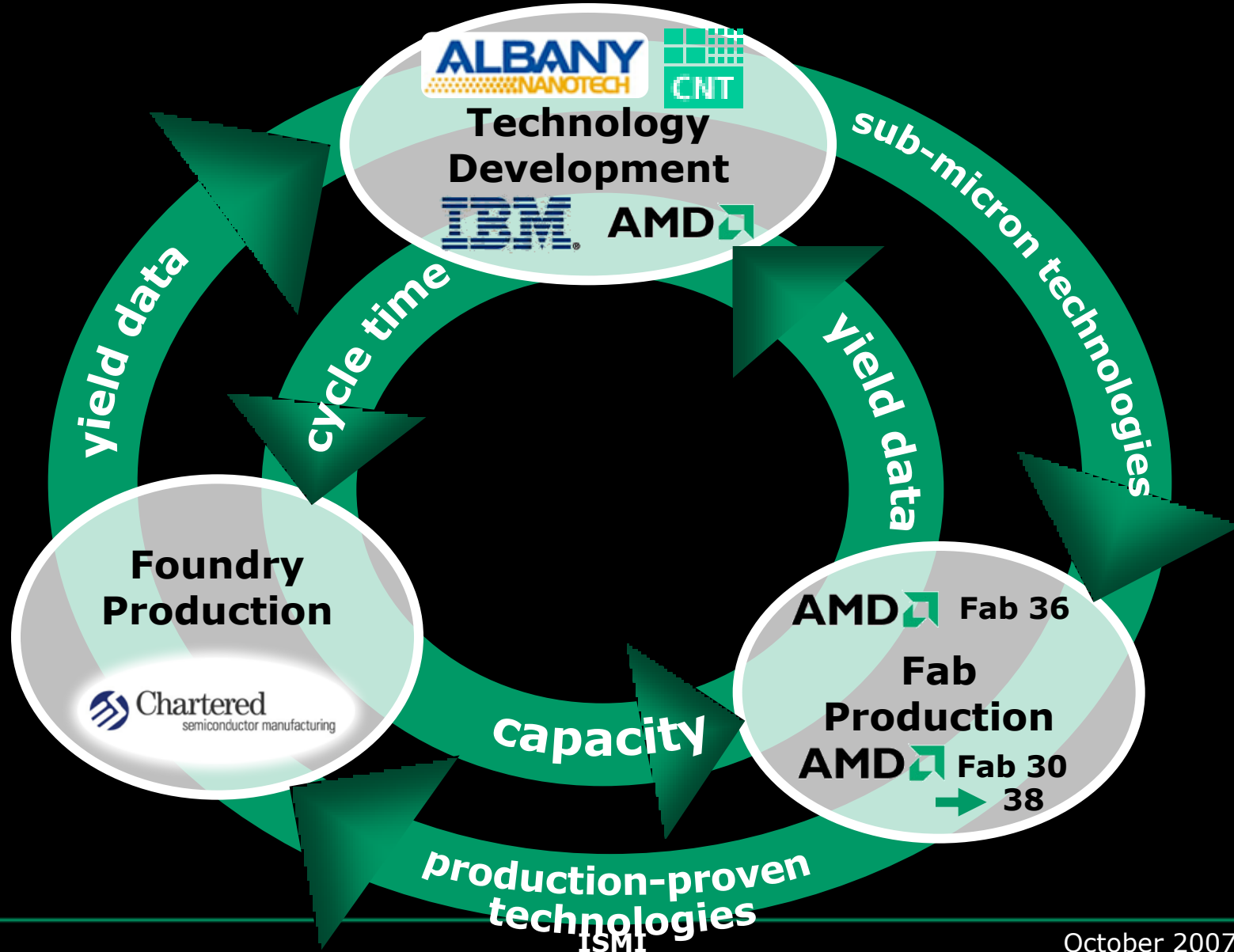
Building the Next Generation Factory – A Lean Framework

Call to Action

Summary

Collaborating for Efficiency

MPU Development and Production



Collaborating for Efficiency: AMD and IBM

Shared Success

Immersion Lithography

**Enables
45nm & below**

Strained Silicon

80%
p-channel
drive current

24%
n-channel
drive current

Low k Dielectrics

15%
wire
delays

High k, metal gates

20%
performance

Vacuum Air Gap Technology

35%
chip speed

15%
energy
consumption

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Customers reap the rewards

- Right products
- Right quantities
- Right time
- Right cost

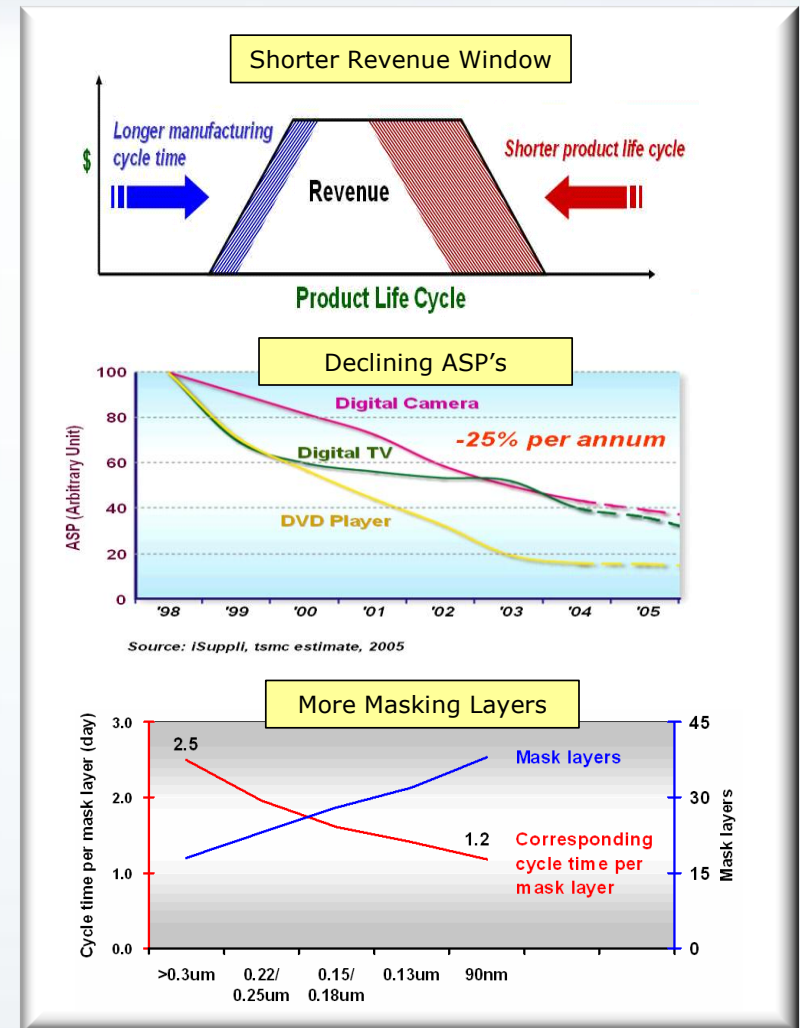
Industry benefits as well

- Capitalize on investment and headroom in 300mm
- Focus on efficiency and cycle-time reduction
- Perfect technologies at 300mm for transition to 450mm
- Investment continues paying dividends at 450mm

Why Fast Cycle Time Focus

Cycle time controls many critical items of importance in manufacturing:

- Turning orders into cash
- Turning ideas into solutions
- Rate of transitioning to new technologies
- Rate of transitioning to different product mix
- Mitigating risk of forecast error
- Mitigating risk of ASP declines
- Finding an excursion
- Mitigating the impact of an excursion
- Offsetting the effect of more masking layers in advanced technologies



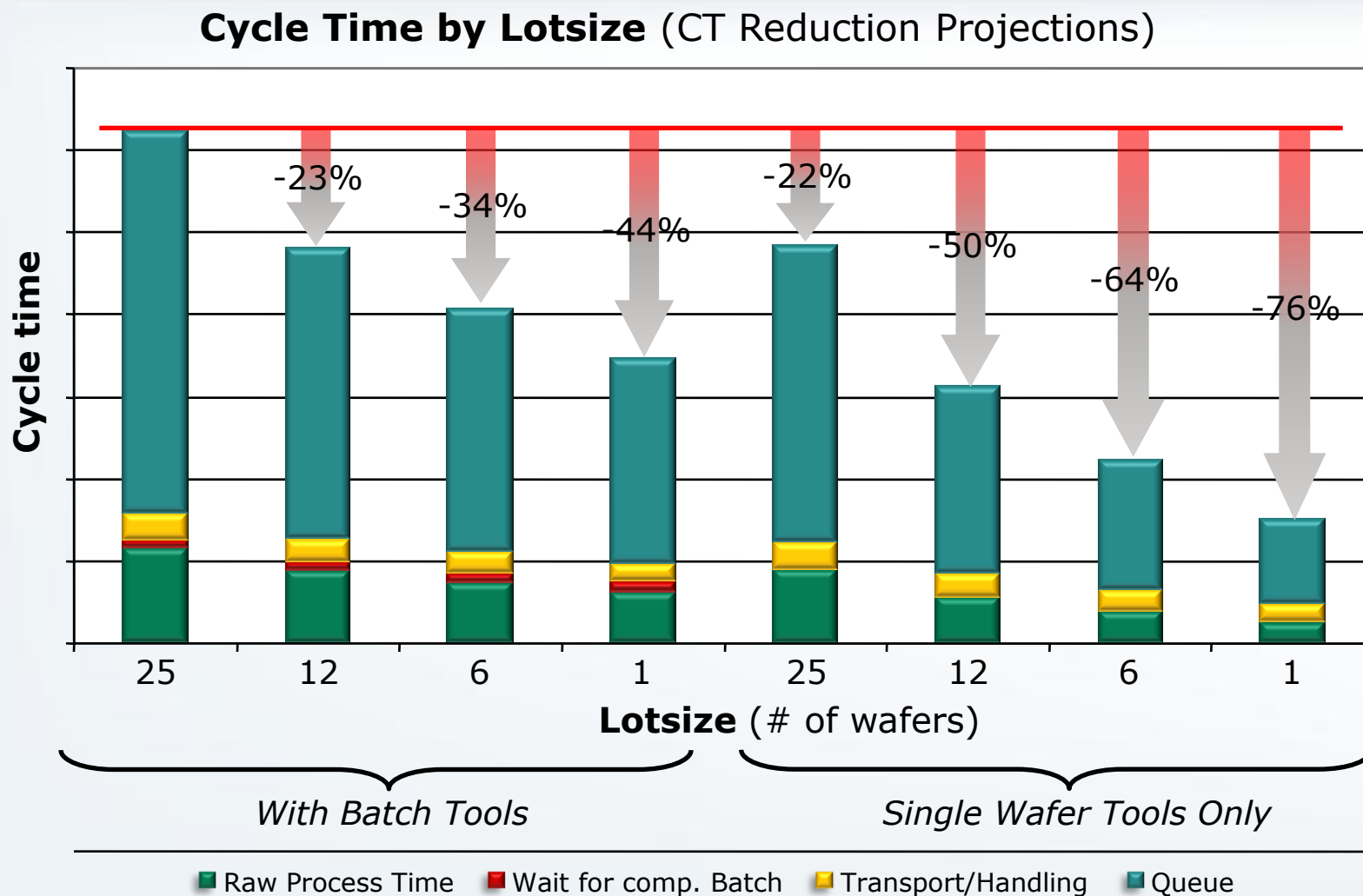
Graphics courtesy of TSMC

Cycle Time: Where to Improve and How?

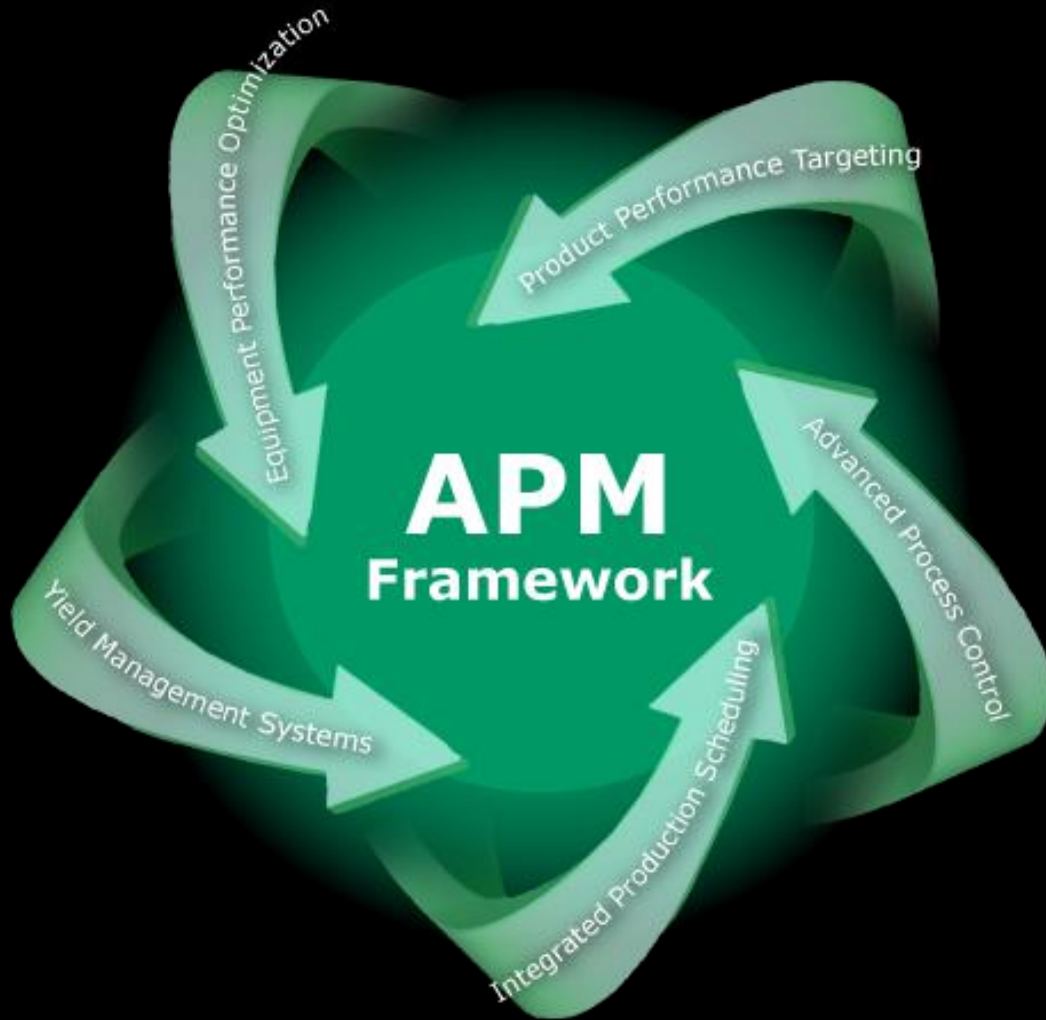
100% Single Wafer Tools (SWT) / Small Lot Size Manufacturing (SLM)

	Tool type	Why?	SWT	SLM
Queue / Stocker	Batch	Batching time, low batch service rate	++	
	Metrology	All wafers queue; only few get measured		+++
	Single Wafer	Low / variable uptime, lot service rate		+
Waiting On Tool	Batch	Lot buffering, long batch process time	++	
	Metrology	All wafers of lot queue; few measured		+++
	Single Wafer	Lot service rate		++
In Process	Batch	long batch process time	+++	
	Metrology	All wafers of lot queue; measured		+++
	Single Wafer	Lot process time		+++

Substantial CT Reductions Achievable



Starts with Automated Precision Manufacturing



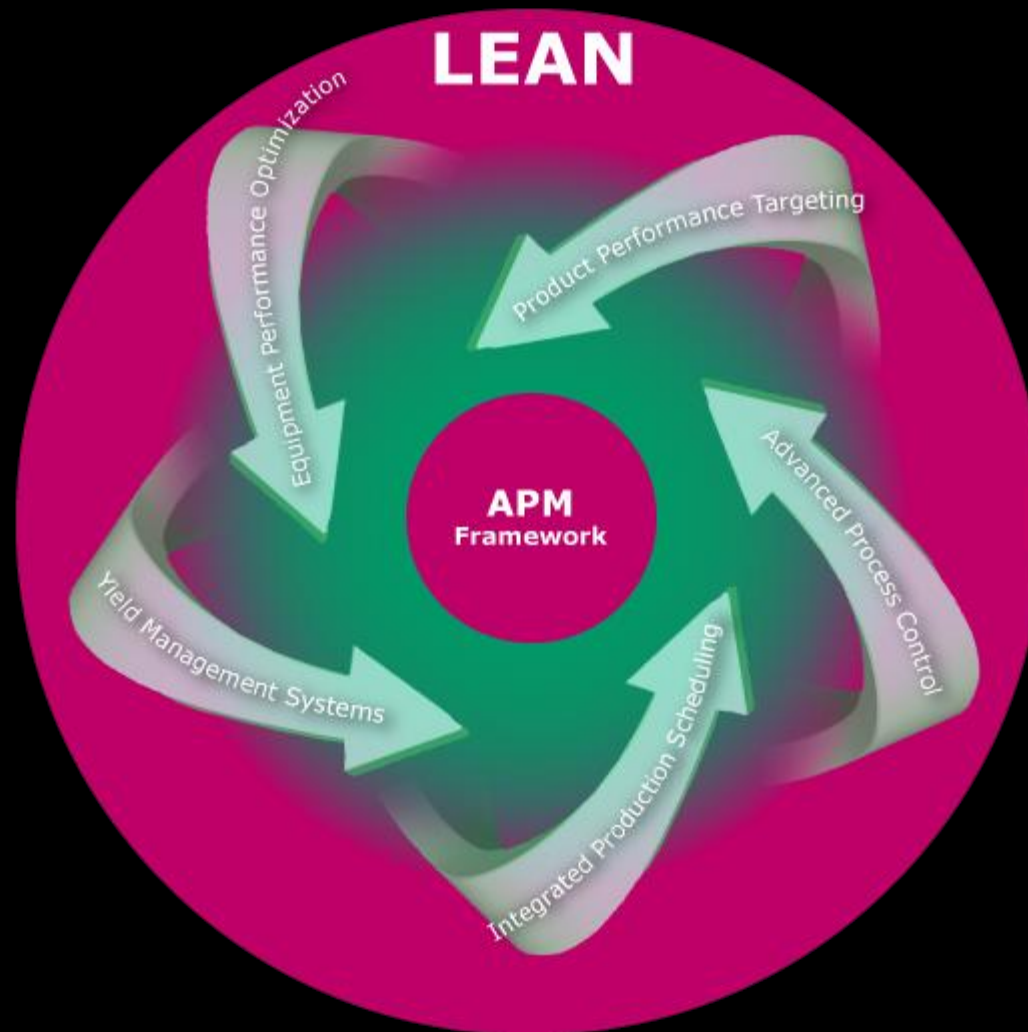
Highly automated and synchronized decision making

Includes proprietary technologies, logic and business processes

Five integrated algorithmic analysis systems — much more than just APC

Fed by fab-wide tool and data integration

Supporting Lean Methods

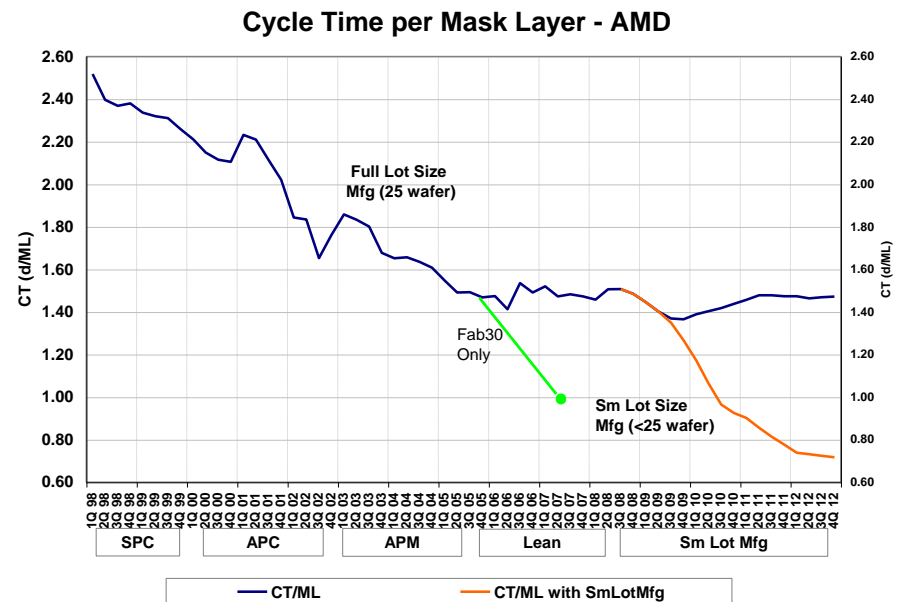


Next generation fabs must deliver substantially shorter cycle time

Target: 50% reduction from today's delivered performance

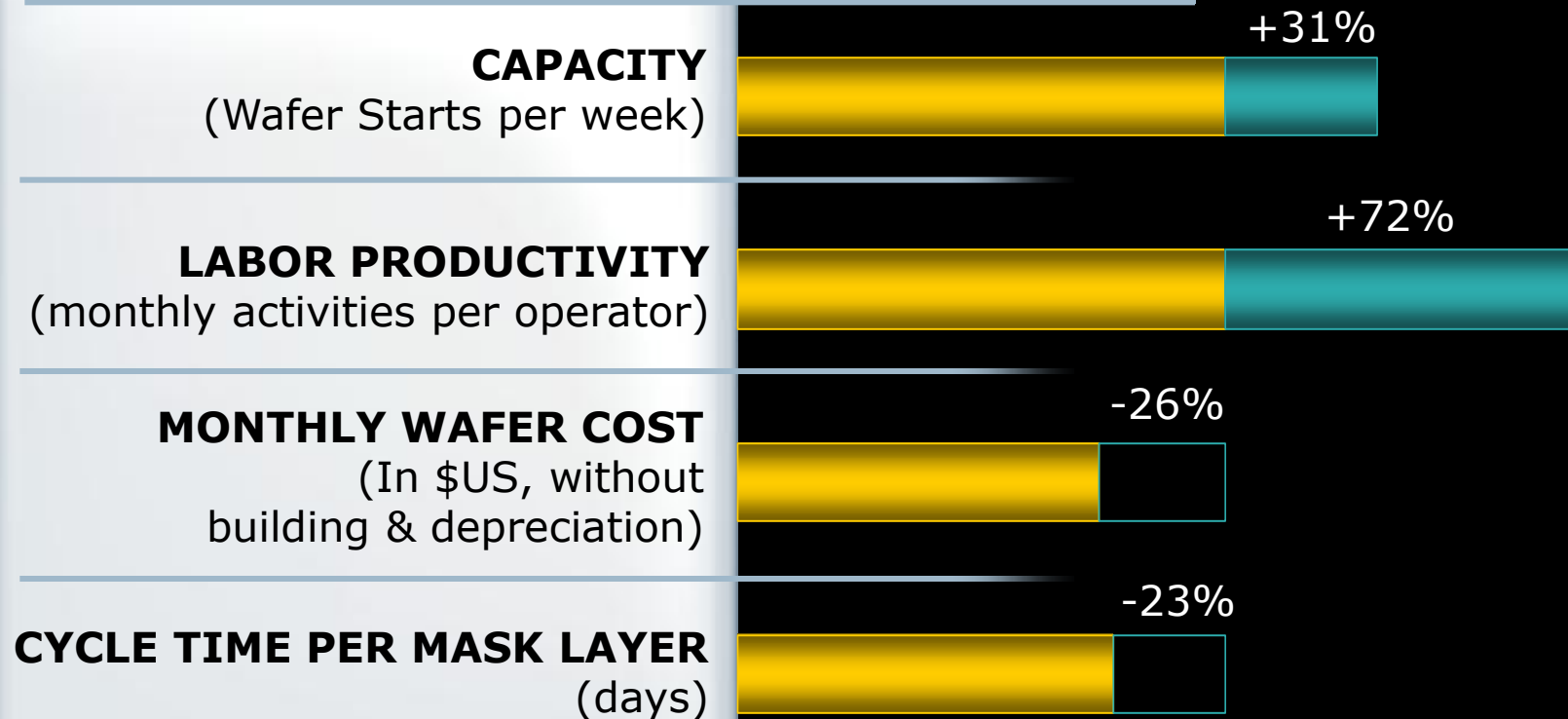
Goal for 300Prime is 0.7d/ML

AMD continues progress to 1d/ML in current installed factories



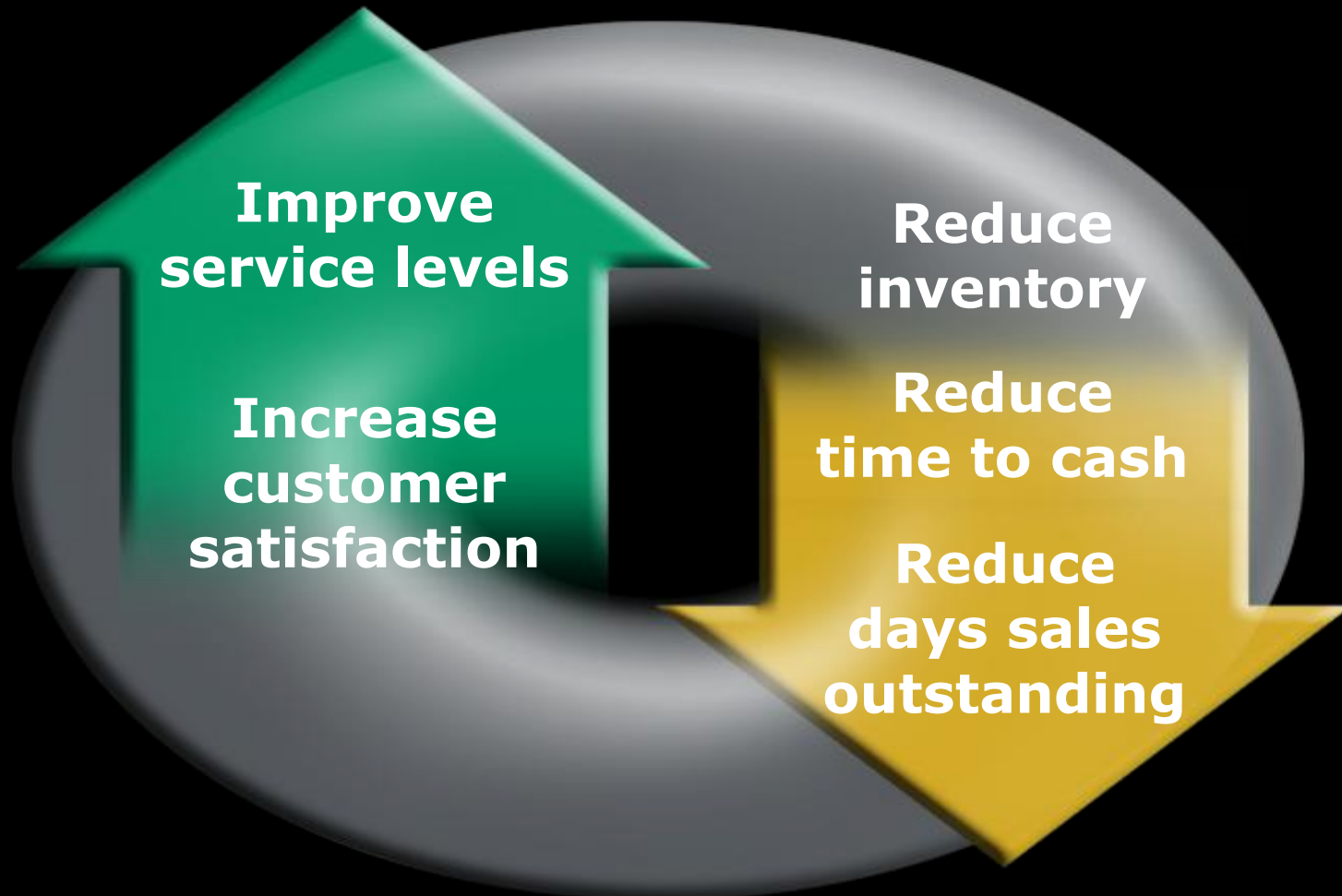
Lean Results on the Fab Floor

Results in Dresden since February, 2005



Dramatic improvements in efficiency and productivity through aggressive and consistent process improvement using lean methodologies

Linked Together: Lean Supply Chain



**Transforming the Supply Chain to a Value Chain
spanning IDMs, suppliers and clients**

Call to Action!

Rethink batch sizes

Greater emphasis on scheduling

Increase equipment changeability

Create mini-batch processing tools

Increase tool predictability and reduce variability

Shift supply chain to accommodate Lean delivery

Reduce total cycle time and wafer waiting – from start to finish

Role of IDMs, Suppliers and ISMI

IDM/Suppliers

- 300mm NGF solutions development and testing environment
- IDM & Supplier collaboration enabler
- Rapid assessment and testing
- Actual NGF solutions deployment

ISMI

- IDM consensus building
- Requirements
- Modeling and simulation
- Drive guidelines & standards
- Collaboration funding
2008 FPEP projects

What AMD is Doing to Help

- Collaborating to bring Suppliers and IDMs into a solutions development and testing environment
- Hosting NGF Summits in Austin
- Complementing ISMI collaboration efforts
 - IDM consensus building
 - NGF Guidelines & Standards
 - Establishing NGF metrics
- Implementing LEAN principles and NGF concepts in its production fab
- Licensing APM to foundry partners

Summary

The industry must come together to forge a path forward

Manufacturing can be transformed to respond quickly to customers' needs

Collaboration is key to achieving the promise of Lean efficiency

With the Next Generation Factory, manufacturers can make full use of current investments while preparing for the future

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